BY ORDER OF THE COMMANDER
TYNDALL AIR FORCE BASE

TYNDALL AIR FORCE BASE
INSTRUCTION 21-136

11 OCTOBER 2011

MAINTENANCE

CIRCUIT CARD REPAIR ELEMENT

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD 21-1, Managing Aerospace Equipment Maintenance, and AFI 21-123, Air Force Repair Enhancement Program (AFREP). This instruction establishes procedures and responsibilities for repair of circuit cards. It details the organizational structure for the 325th Fighter Wing's Circuit Card Repair (CCR) Element and defines levels of CCR, training requirements, equipment requirements, and documentation required. This instruction applies to all personnel assigned to the 325th Fighter Wing involved with aircraft operations and maintenance involved with any circuit card component operations. It will be used to formalize the process for implementing repair initiatives on electronic systems (nonflight related, safety-of-flight, nonsafety-of-flight, and weapons release system components) coded nonrecoverable condemn any level (XB3), recoverable condemn by field (XF3), and recoverable condemn by depot (XD2). It applies to all equipment with source, maintenance, and recoverability (SMR) codes that restrict field-level repair. This instruction requires collecting and maintaining information protected by the Privacy Act of 1974 authorized by 10 U.S.C. 8013, AFI 21-101, AFI 36-2232, and E.O. 9397. System of records notice F021 AF IL A Core Automated Maintenance System (CAMS) applies. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, Management of Records, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at https://www.my.af.mil/gcss-af61a/afrims/afrims/.

SUMMARY OF CHANGES

Glossary of References and Supporting Information has changed

1. PURPOSE AND SCOPE OF CIRCUIT CARD REPAIR FUNCTION.

1.1. The CCR Element determines feasibility of repairing circuit card assemblies and electronic equipment, coordinates authorization to perform field-level repairs (when required), performs diagnostic tests and repairs of all such equipment, and documents all repair actions (to include historical data and cost avoidance).

1.2. The CCR Element is assigned to, the 325th Maintenance Group (MXG), Quality Assurance (QA), Air Force Repair Enhancement Program (AFREP) (MXQP) Flight. All manpower positions authorized to the CCR Element will be transferred to the QA Flight's Unit Manpower Document. The operational chain of command runs from the senior CCR supervisor to the AFREP Manager to the QA Flight Commander/Chief to the 325 MXG Commander (CC).

2. RESPONSIBILITIES.

2.1. The AFREP Manager will:

2.1.1. Assign appropriate personnel to the CCR Element, oversee CCR operations, monitor CCR repair initiatives, review CCR production levels, monitor cost savings, cost avoidance, and expenditures, and to facilitate approval of 2 TAFBI 21-136 30 January 2008 repair initiatives. Ensure at least one technician possessing solder qualifications is assigned in accordance with AFI 21-123 and AFI 21-123_AETCSUP1 and that all assigned personnel receive sufficient training and certifications to support the wing's mission.

2.1.2. Obtain funding for required equipment.

2.2. The senior CCR supervisor will:

2.2.1. Prepare correspondence providing essential information to, the 325 MXG/CC, Headquarters AETC, and appropriate depot to obtain proper authorization for all repair initiatives. This includes official messages, AFTO Form 135, *Source, Maintenance, and Recoverability Code Change Request*, AFTO Form 22, *Technical Order Improvement Report and Reply*, *The Air Force Innovative Development Through Employee Awareness (IDEA) Program or the IDEA website at:* **https://ipds.mont.disa.mil/** and expanded maintenance task requests.

2.2.2. Oversee daily CCR operations, conduct repair feasibility studies, track repairs and costs avoided, and act as direct liaison between CCR and customers.

2.2.3. Track historical data on repair initiatives and cost avoidance on a monthly basis. Obtain authorization for depot-level repairs at the local level and complete documentation on repair initiatives.

2.2.4. Evaluate proficiency and production skills of assigned personnel, conduct on-the-job-training, schedule personnel for advanced CCR training and ensure annual re-certifications are accomplished.

2.2.5. Ensure CCR possesses diagnostic and repair equipment authorized in Allowance Standard 783, Part F, as needed.

3. PROCEDURES.

3.1. Routing:

3.1.1. The owning work-center will remove and replace the defective component in accordance with applicable technical order(s). Place a demand on supply for replacement component. Complete and attach an AFTO Form 350 to the asset (include a point of contact to provide any additional information required during the repair process). Deliver reparable to CCR along with all available technical data for the equipment to be repaired.

3.1.2. After repair, the owning work-center will install the repaired component into the end item and perform complete diagnostic testing in accordance with applicable technical order. If the component does not pass diagnostic testing, return the component to CCR with full details of the indicated malfunction.

3.2. Repair:

3.2.1. CCR will determine the expandability, recoverability, reparability code, SMR code, and TO repair restrictions for all repair candidates in accordance with AFI 21-123, TO's 00-20-3, 00-25-195, and 00-25-234. Determine if the repair candidate is a safety-of-flight or weapons release component as detailed in Attachment 1. ***Repair of safety-of-flight or weapons release components is not performed by the CCR Element.***

3.2.2. CCR will screen all repair candidates to determine feasibility of repair. This will be accomplished by (as a minimum) querying the supply system to determine consumption trends, researching availability and costs of installed components, and ensuring CCR possesses (or has access to) all necessary technical data, tools, and test equipment to perform diagnostic testing, troubleshooting and repairs.TAFBI 21-136 30 January 2008 3

3.2.3. CCR will request local repair authorization for feasible repair candidates that are XD coded, per procedures required by AFI 21-123, via an expanded maintenance task request. Submit SMR code change request for feasible repair candidates (as required) in accordance with TO 00-25-195. Submit a Silver Disc with electronic signature of repair candidates to the applicable lead wing in accordance with TO 33D7-38-308-2.

3.2.4. CCR will test, troubleshoot, and repair feasible candidates in accordance with equipment specific technical orders, commercial data, and general TO procedures. If using the Huntron Protrack I, Model 20A/Protrack Scanner I or Pinpoint Diagnostic System, automated diagnostic steps contained in the menu-driven software will be used (refer to TO's 33AA-18-65-1, 33D7-38-308-1, and 33D7-38-308-8-11).

3.3. Turn-in: If a repaired component passes diagnostic testing, the owning work-center will determine appropriate disposition for the asset: leave the component installed and turn the end item into supply as a serviceable asset, return the repaired component to supply, or store the component in work-center's operating stock for future use. For other items, CCR will process TIN actions as required.

3.4. Historical Data Tracking: CCR will document repair action(s) on the CCR automated data entry sheet (Attachment 2). Enter repair action and cost savings data into the CCR automated database. Document repair actions in the core automated maintenance system (CAMS) in accordance with AFCSM 21-563 Volume 2, *Job Data Documentation*.

3.5. Quality Process Evaluation: CCR will perform quality inspection on repair candidate following repair actions: review repair action(s) for appropriateness, inspect workmanship, and complete/attach appropriate serviceability condition tag.

4. TRAINING REQUIREMENTS.

4.1. Personnel selected to work in the CCR Element must possess a minimum of a 5-skill level in an electronics maintenance Air Force Specialty unless waived by the QA Flight Commander/Chief.

4.2. At least one technician assigned to the CCR Element must have successfully completed solder training and receive annual recertification in accordance with AFI 21-123. This training will be tracked via TBA (Training Business Area). Technicians must have successfully completed the Miniature Circuit Card Repair Course (TBA Task ID WJQS-55572-001.003) and the Micro-Miniature Circuit Card Repair Course (TBA Task ID WJQS-55572-001.004) or equivalent certified training to perform repairs on multi-layer circuit cards

4.3. All on-the-job-training will be documented in the technician's AF Form 623 using AF Form 797 (or other computer generated tracking form).

5. Forms or IMTS (Adopted): AFTO Form 135, Source, Maintenance, and Recoverability Code Change Request, AFTO Form 22, Technical Order Improvement Report and Reply, AF Form 623, Individual Training Record Folder, and AF Form 797, Job Qualification Standard Continuation/Command JQS

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 21-101, *Aerospace Equipment Maintenance Management*

AFI 21-123, *Air Force Repair Enhancement Program (AFREP)*

AFI 38-401, *The Air Force Innovative Development through Employee Awareness (IDEA) Program*

Navy(NAVSEA) ST900-HN-GPT-020, *Department of Defense Protrack I Model 20A/Protrack Scanner I Technical Reference and Operation Manual*

TO 00-5-1, *AF Technical Order System*

TO 00-20-3, *Maintenance Processing of Reparable Property and the Repair Cycle Asset Control System*

TO 00-25-195, *AF Technical Order System Source, Maintenance, and Recoverability Coding of Air Force Weapons, Systems, and Equipment*

TO 00-25-234, *General Shop Practice Requirements for the Repair, Maintenance and Test of Electrical Equipment*

TO 1-1A-15, *General Maintenance Instructions for Support Equipment*

TO 31-1-141-1, *Basic Electronics Technology and Testing Practices – General Testing Information and Safety Precautions*

TO 31-1-141-2, *Basic Electronics Technology and Testing Practices – Magnetic and Electrical Fundamentals*

TO 31-1-141-3, *Basic Electronics Technology and Testing Practices – Basic Electronic Circuit Theory*

TO 31-1-141-4, *Basic Electronics Technology and Testing Practices – Semiconductor Circuit Theory*

TO 31-1-141-5, *Basic Electronics Technology and Testing Practices – Mathematics for Electrical and Electronics Technicians*

TO 31-1-141-6, *Basic Electronics Technology and Testing Practices – Basic Computer Programming Techniques*

TO 31-1-141-7, *Basic Electronics Technology and Testing Practices – Testing Equipment*

TO 31-1-141-8, *Basic Electronics Technology and Testing Practices – Fundamental Measurements*

TO 31-1-141-9, *Basic Electronics Technology and Testing Practices – Testing Techniques and Practices*

TO 31-1-141-10, *Basic Electronics Technology and Testing Practices – Merit Measurements*

TO 31-1-141-11, *Basic Electronics Technology and Testing Practices – Transmission Line and Waveguide Principles and Measurements*

TO 31-1-141-12, *Basic Electronics Technology and Testing Practices – Antenna Principles ad Measurements*

TO 31-1-141-13, *Basic Electronics Technology and Testing Practices – Modulation Techniques*

TO 31-1-141-14, *Basic Electronics Technology and Testing Practices – Autotune Mechanisms*

TO 31-1-141-15, *Basic Electronics Technology and Testing Practices – Parts Replacement and Substitution*

TO 33D7-34-9-1, *Department of Defense Huntron Tracker 2000 A/B Operation and Maintenance Manual*

TO 33D7-38-308-1, *Department of Defense MTR Gold Disk Test Routine Development Requirements Manual*

TO 33D7-38-308-8-11, *Department of Defense Module Test and Repair Users Manual*

TO 34W7-8-1, *PACE Component Soldering/Desoldering and Bench-Top Circuit Board Repair Work Station Models PRC 2000 and 2000E*

AFI 21-123_AETC SUP 1, *Air Force Repair Enhancement Program (AFREP)*

TO 00-5-1/AETC SUP 1, *AF Technical Order System*

Attachment 2

SAFETY-OF-FLIGHT AND WEAPONS RELEASE COMPONENTS

If the first four characters of a CCR repair candidate's work unit code (WUC) matches a line replaceable unit listed below, do not attempt repair.

WUC	NOMENCLATURE
13HA	Anti-Skid Controller
41AB	Avionics Circuit Air Controller
42AF	Generator Control Unit
42FF	Emergency Electronic Motor-Generator Control
44EC	Caution Light Logic Unit
49CA	Engine Ice Detector
51EA	Air Data Computer
51EF	Electronic Air Inlet Controller
51NB	Flight Director Adapter
52AA	Pitch Flight Control Computer
52AB	Roll/Yaw Flight Control Computer
57AC	MSIP Central Computer / VHSIC Central Computer
71AK	Navigation Control Unit
74MA	Multipurpose Color Display
75MA	Armament Control Panel
75MC	Converter Programmer
75PA	PAC Converter Programmer

Attachment 3

SAMPLE CIRCUIT CARD REPAIR TRACKING SHEET

Transaction History Sheet **Transaction Number:**
Job Control Number:

Date Received: **Doc. Number** **Serial Number:**
National Stock Number: **Part Number:**
Nomenclature: **Unit:**
SMR Code: **ERRC:** **Work Unit Code:**
350 Tag Number: **Cost Allowed:** **Exc. Cost:**
Malfunction:

Repair Time: **Priors:** **Last issued on:**
Days Ago
C o r r e c t i v e A c t i o n **Emp Number** **Date**

R e p l a c e m e n t P a r t

NSN	**Part Number**	**QTY**	**Cost**

C C R T r a c k i n g S h e e t

CCR Tracking Number:

Nomenclature: **Serial Number:**

National Stock Number: **ERRC**

Part Number: **Transaction Number:**

Name: **SQ:** **Phone:**

Signature: **Date:**